

CLAIMS

1. A method for managing print jobs using a print subsystem despooling backplane, the method comprising:
 - 5 backplane input interface;
 - calling a despooling backplane plugin;
 - converting the print job into an internal representation (IR) document;
 - processing the IR document in response to a plugin;
 - 10 converting the processed IR document into a processed print job; and,
 - supplying the processed print job at a despooling backplane output interface.
- 15 2. The method of claim 1 wherein calling a despooling backplane plugin includes calling plugins chosen from the group including:
 - user-selected plugins;
 - predetermined plugins responsive to criterion such as printer
- 20 driver, printer model, printer configuration, printer condition, user, administrative grouping, document content, and document type; and,
 - plugins called from other plugins.
3. The method of claim 1 wherein converting the print job into an IR document includes converting the print job into an IR document

that is independent of a printer device target and the language format associated with a printer device target.

4. The method of claim 3 wherein processing the IR document in response to the plugin includes performing a process selected from the group including translating the print job into an IR document, analyzing, modifying the print job data, modifying control of the print job, gathering print subsystem-external information related to the print job, producing print subsystem-external information related to the print job, 10 setting print subsystem-external information related to the print job, and reassembling IR documents.

5. The method of claim 4 wherein calling a despooling backplane plugin includes calling a plurality of plugins; and, 15 wherein processing the IR document in response to the plugin includes using the plurality of plugins to perform an action selected from the group including parallel processing the IR document, serially processing the IR document, and processing the IR document using a combination of parallel and serial processes.

- 20 6. The method of claim 5 wherein reassembling IR documents includes removing conflicts between a plurality of processed IR documents; and, wherein converting the processed IR document into a 25 processed print job includes converting the plurality of IR documents into the processed print job.

7. The method of claim 4 wherein accepting a print job at a print subsystem despooling backplane input interface includes accepting a print job in a first language format associated with a first printer device type;

wherein setting print subsystem-external information related to the print job includes selecting a second printer device type; and,

wherein converting the processed IR document into a processed print job includes converting the IR document into a processed print job in a second language format associated with the second printer device type.

8. The method of claim 4 wherein gathering print subsystem-external information related to the print job includes monitoring a printer condition selected from the group including the availability of connected printing devices, currently printing print jobs, pending print jobs, completed print jobs, print job failures, printer performance, printer locality, and printer capabilities.

9. The method of claim 8 wherein monitoring a printer condition includes:

querying a node selected from the group including a print subsystem spooler, a print subsystem port manager, a printer manager, a print service, and a printer; and,

25 maintaining a cache of printer condition information.

10. The method of claim 1 wherein converting the print job into an IR document includes storing the IR document as shared data; and,

wherein processing the IR document in response to the
5 plugin includes processing the IR document accessed from shared data.

11. The method of claim 4 wherein translating the IR document includes parsing spool/raster image processor (RIP) footers and headers, parsing a print job control header, and parsing language data
10 selected from the group including raster, image, and page description language (PDL) data.

12. The method of claim 11 wherein parsing a print job control header includes:

15 calling a plurality of printer job control header plugins selected from the group including printer job language (PJL) and job definition format (JDF) plugins; and,
using the print job control header plugin that recognizes the print job control header data.

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13. The method of claim 11 wherein parsing language data includes:

calling a plurality of language plugins selected from the group including raster, image, printer control language (PCL), portable
25 document format (PDF), PostScript (PS), PCL XL, HP GL/2, IPDS, Escape P, SCS, and TIFF plugins; and,

using the language plugin that recognizes the language data.

14. The method of claim 4 wherein analyzing the IR document includes performing an action selected from the group including
 - 5 job accounting, printer pooling, job splitting, access control, security, content filtering, resource downloading, compression, reformatting, and language translation.
15. The method of claim 4 wherein gathering print subsystem-external information related to the print job includes gathering information selected from the group including a print subsystem host, a printer, a printer device manager, and a print service.
16. A print subsystem despooling backplane, the backplane comprising:
 - a library of despooling backplane plugins;
 - a controller having an interface to accept a print job, the controller converting the print job to an internal representation (IR) document and supplying the IR document at an interface;
 - 20 a component processor having an interface to call a plugin from the library and an interface to accept the IR document, the component processor processing the IR document in response to a plugin, converting the processed IR document into a processed print job, and supplying the processed print job at an interface.

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17. The backplane of claim 16 wherein the component processor calls plugins chosen from the group including:
- user-selected plugins;
- predetermined plugins responsive to criterion such as printer
- 5 driver, printer model, printer configuration, printer condition, user, administrative grouping, document content, and document type; and, plugins that are called from other plugins.
18. The backplane of claim 16 wherein controller converts
- 10 the print job into an IR document that is independent of a printer device target and the language format associated with a printer device target.
19. The backplane of claim 18 wherein the component processor performs a process selected from the group including translating
- 15 the print job into an IR document, analyzing, modifying the print job data, modifying control of the print job, gathering print subsystem-external information related to the print job, producing print subsystem-external information related to the print job, setting print subsystem-external information related to the print job, and reassembling IR documents.
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20. The backplane of claim 19 wherein the component processor calls a plurality of plugins and uses the plurality of plugins to perform an action selected from the group including parallel processing the IR document, serially processing the IR document, and processing the
- 25 IR document using a combination of parallel and serial processes.

21. The backplane of claim 20 wherein the component processor reassembles IR documents to remove conflicts between a plurality of processed IR documents and converts the plurality of IR documents into the processed print job.

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22. The backplane of claim 19 wherein the controller accepts a print job in a first language format associated with a first printer device type; and,

wherein component processor uses print subsystem-external
10 information related to the print job to select a second printer device type and convert the IR document into a processed print job in a second language format associated with the second printer device type.

23. The backplane of claim 19 wherein the component
15 processor gathers print subsystem-external information related to the print job by monitoring a printer condition selected from the group including the availability of connected printing devices, currently printing print jobs, pending print jobs, completed print jobs, print job failures, printer performance, consumables, printer locality, and printer
20 capabilities.

24. The backplane of claim 23 wherein the component processor monitors a printer condition includes by:

querying a node selected from the group including a print
25 subsystem spooler, a print subsystem port manager, a printer manager, a print service, and a printer; and,

storing the printer condition information in cache.

25. The backplane of claim 16 further comprising:

a shared data memory; and,

5 wherein the component processor accepts the IR document, stores the IR document in the shared data memory, and accesses the IR document from shared data memory for processing.

26. The backplane of claim 19 wherein the component

10 processor translates the print job into an IR document by parsing spool/raster image processor (RIP) footers and headers, parsing a print job control header, and parsing language data selected from the group including raster, image, and page description language (PDL) data.

15 27. The backplane of claim 26 wherein the component processor parses a print job control header by:

calling a plurality of printer job control header plugins selected from the group including printer job language (PDL), and job definition format (JDF); and,

20 using the print job control header plugin that recognizes the print job control header data.

28. The backplane of claim 26 wherein the component processor parses the language data by:

25 calling a plurality of language plugins selected from the group including raster, image, printer control language (PCL), portable

document format (PDF), PostScript (PS), and PCL XL, HP GL/2, IPDS, Escape P, SCS, and TIFF plugins; and,

using the language plugin that recognizes the language data.

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29. The backplane of claim 19 wherein component processor analyzes the IR document by performing an action selected from the group including job accounting, job control, printer pooling, job splitting, access control, security, content filtering, resource downloading, 10 compression, reformatting, and language translation.

30. The backplane of claim 19 wherein the component processor gathers print subsystem-external information related to the print job by gathering information selected from the group including a 15 print subsystem host, a printer, print service, and a printer device manager.